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TORULA HISTOLYTICA (CRYPTOCOCCUS HOMINIS) INFECTION*

Report of Case Refractory to Sulfonamides

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Approximately eighty instances of torula histolytica meningitis have been reported in the literature. Less than half have been diagnosed before death. Tuberculous meningitis, encephalitis, lymphocytic choriomeningitis and encephalomalacia are some of the conditions mistakenly diagnosed. There has been a surprisingly high incidence of Hodgkin's disease[1] associated with torulosis. Many cases have involvement of the lungs as well as meninges.[2,3,5] General torulosis is much less frequent, as mentioned by Burger and Morton,[20] who reported the fourteenth such case. The case reported here is probably the fifteenth. The yeast-like organism is very prevalent in nature, having been found in wasps' nests, insects, stems of grasses and plants and in canned milk.[3,5,5] It is frequently found on the skin surface as a saprophyte. Apparently it becomes pathogenic for man, only when, for some so far unknown reason, its virulence is greatly increased. The resulting disease has been considered almost universally fatal, although some cases have lived many months. The treatment has so far been unsatisfactory. Repeated lumbar puncture has given greatest symptomatic relief. A galaxy of medicaments has been used, including autogenous vaccines, arsenic, iodides, colloidal silver, thyroid, gentian violet, tartar emetic, acriflavine, methenamine, mercurochrome, and tyrocidine.[6,7,8,17] Marshall and Teed[9] called attention to reports[10,11,12] of localized torula infection in parts of the body, aside from central nervous system, in which the prognosis is fairly good. They also mentioned three instances of apparent remission in torula meningitis. One case, reported by Binford,[13] was living a year after diagnosis, with the organism still present in the spinal fluid. The second case was reported by Toone[14] in which the infection had lasted twenty months at the time of the report. The third case, reported by Reeves, Butt and Hammock[15] was probably the first case to receive sulfonamide therapy. This patient, a girl of fifteen, seemed quite well two and a half years after the original acute torula infection. The authors felt, however, that improvement in both chest and spinal fluid findings began before sulfonamides were given, and probably was not affected by the moderate amount of chemotherapy administered. Marshall and Teed[9] then went on to report in detail a case of a seven-year-old girl operated upon for bilateral mastoid disease, in which destroyed mastoid cells were found sterile on culture, and in which no torulae were found on the mastoid smears but in which a torula meningitis was found by lumbar puncture immediately after operation. Spinal fluid culture and smear showed torulae in large numbers. A rather prolonged convalescence followed. Sulfadiazine therapy was instituted and the child seemed to be well five months later. No torulae were found in the spinal fluid after the third day of treatment. The authors felt that the improvement or possible cure was due to the sulfonamide. If such should prove to be the case, it represents the only such instance reported. Cohen[16] reported a case of torulosis with binocular papilledema and associated with Hodgkins' disease, in which he administered sulfadiazine to give a spinal fluid level of 7.1 mg.%, without discernible effect. Tinney and Schmidt[17] gave sulfadiazine to one patient for thirty days with a blood level of 5 mg.% and obtained no therapeutic effect. Another patient improved with a sulfathiazole blood level over 6 mg%.

More recently Jones and Klinck[18] concluded

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in a case report that neither sulfonamides nor penicillin were effective for the strain of torula isolated from their patient. Most of their evidence is from in vitro experiments rather than from therapeutic trial. At the same time that Jones and Klinck were observing their case we were using sulfonamides in another case, a report of which follows.

CASE REPORT

L. Mcl)., a forty-nine-year-old Negro, was admitted to the Delaware Hospital on October 26, 1942. He complained of drowsiness and headache of six months duration. He was mentally sluggish and did not answer questions intelligently. His nutrition was poor and there was marked general weakness. The pupils reacted normally. The tongue was coated. There was bilateral crusty nasal discharge. The heart was negative on physical examination. The abdomen was soft and no masses were palpable. There was an old, deep, healed sinus tract in the lower right abdominal quadrant. Rectal examination was negative.

In the past he had been operated upon elsewhere in 1926 for gangrenous appendicitis. A fistula remained, necessitating two subsequent operations.

COURSE IN HOSPITAL

He had an irregular fever, 97° F. to 102° F. His mental condition varied but on the whole became progressively more dull and irrational. He was depressed and disoriented, but there was no active delirium. There was no stiffness of the neck.

10-26-42—Admitted to hospital.

11- 1-42—An infection related to the old sinus tract was suspected. However, a barium enema was quite negative, as was also a retrograde pyelogram and cystoscopic examination. Lipiodal injected into the sinus tract revealed no connection with any sinus or cavity.

11-16-42—An x-ray of the chest (Fig. 1) revealed a rounded mass about 7½ cm. in diameter, posteriorly at the right lung base. The heart was normal by x-ray.

11-19-42—The spinal fluid was clear but the pressure was increased to 400 mm. water. Cell count 500 per cu. mm.

11-30-42—Chest x-ray, no change.

12-21-42—Chest x-ray. Mass at right base was slightly larger.

1- 4-43—Torula histolytica was first isolated from spinal fluid.

1-20-43—Material aspirated from the mass in the right chest showed torula both on smear and culture. (Fig. 2)

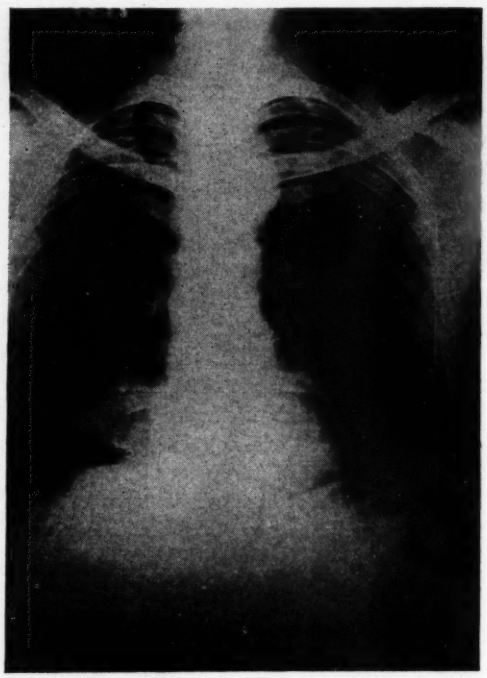

Fig. 1 — Mass in right lower lung field due to torula.

6- 8-43—Died after several months of therapy summarized below.

LABORATORY FINDINGS

Urinalyses were repeatedly negative except for some increase in W. B. C.

Blood Picture: Nov., 1942, R. B. C., 5.2 m.; Hb., 11.5 gm.; W. B. C., 7,200. March, 1943, R. B. C., 5.0 m.; Hb., 11.5 gm.; W. B. C., 5,200. Differential essentially normal.

Blood Sugar: 116 mg.%.

Blood Urea: N., 13 mg%..

Blood Cultures: Five were made, with no growth.

Blood Wassermann: Negative.

Stool Cultures: Negative for enteric disease group.

Blood Serum: Agglutinations were found negative with typhoid, para-typhoid A & B, Brucella. Proteus OX19, and B. tularense antigens.

Spinal Fluid: Average pressure, 500 mm. of water. Cell count, 300-500 per cu. mm., mostly small lymphocytes. Proteins, 270 mg.%; Sugar, 15 mg.%; Sodium chloride, 600-700 mg.%; Pandy, 3-4%; Wassermann, negative. Torula histolytica was recovered from spinal fluid and chest lesions, but not from the sinus tract.

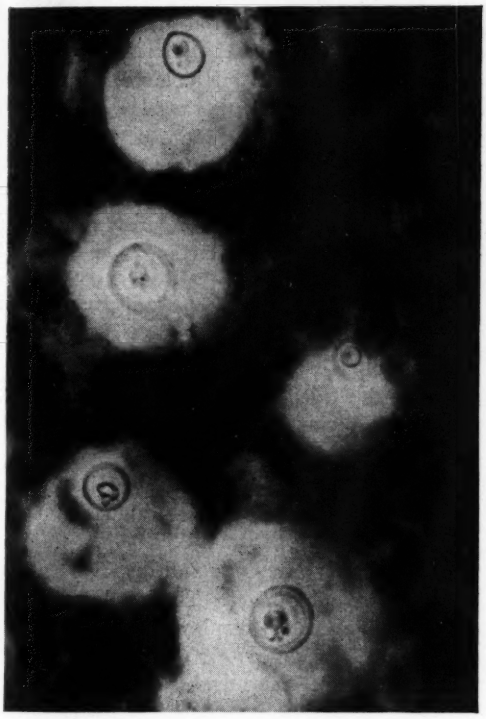

Fig. 2 — India ink preparation of material aspirated from lung lesion.

THERAPEUTIC SUMMARY

11-26-42 to 1-3-43—Sulfathiazole daily, every 4 hours. 45 gm. total.

1-10-43 to 2-2-43—Sulfadiazine daily, every 4 hours. 115 gm. total. Blood level, 8 mg.%; spinal fluid level, 4.5 mg.%.

2-12-43 to 3-8-43—Potassium iodide, 20 gr. t. i. d.

2-17-43 to 3-8-43—Sulfathiazole daily, every 4 hours. 100 gm. total. Spinal fluid level, 1.4 mg.%.

3-11-43 to 3-24-43—Antimony and Potassium Tartrate, 5 cc. of a 1% solution i. v. every 2nd day.

3-26-43 to 4-1-43—10 cc. of a 1% solution Antimony and Potassium Tartrate i. v. daily.

4-1-43 to 4-13-43—15 cc. of a 1% solution i. v. daily.

BACTERIOLOGICAL STUDIES

Sediment of spinal fluid received 1-4-43 was inoculated to Brewer's thioglycollate medium, Sabouraud dextrose agar plates, incubated at room and 37° C. temperature, and a blood agar plate. Stained films of sediment revealed no gram-positive, gram-negative, or acid-fast bacteria. After 24 hours incubation, visible growth appeared on blood agar and both Sabouraud plates, as a well-defined, minute, elevated, whitish, circular, glistening, pin-point colony, films of which showed gram-positive, yeast-like, budding forms. After 72 hours incubation, the organism grew as a yellowish, pasty colony 1 mm. in diameter, with no hemolysis on blood agar; and as a greyish, mucoid colony 2-3 mm. in diameter, with a tendency for colonies to run together, on Sabouraud plates. No growth occurred on thioglycollate medium.

Re-examination of cultures of previous specimens inoculated on 11-20-42 and 12-1-42, on Wallenstein's egg-yolk medium (for T. B.) showed a mucoid, confluent, yellowish-brown growth, with a marked tendency to slide down the slant. India-ink preparations (Levin) of this growth showed typically double-contoured, highly refractive, round and oval yeast-like forms 5-6 mm. in diameter, with a marked halo, or capsule surrounding each cell. Methylene-blue stained films showed budding forms, with no hyphae.

The organisms grew well in nutrient and glucose acid broths, with a slightly turbid supernatant and finely granular sediment. Carbohydrate broths showed acid production only in dextrose and sucrose, with no change in maltose, mannite, lactose, xylose, rhamnose, and dulcitol broths after 8 days incubation. A hanging dropbroth-agar preparation showed no mycelia or spores after 8 days incubation. Although no animals were injected, it was felt that the organism described fulfilled the mor-

phologic and cultural characteristics of torula histolytica.

India-ink preparations of material obtained by lung aspiration 1-28-43 showed the characteristic halo appearance of torula (Fig. 2) and cultures of same gave identical reactions as previously described.

Torula histolytica was repeatedly cultured from the spinal fluid in which the sulfonamide level was 3 to 4.5 mg.%.

IN VITRO EXPERIMENTS

In an attempt to make a rough estimation, in vitro, of the relative antibiotic effect of various sulfonamides, Sabouraud dextrose agar slants, pH 7.4, were prepared with sulfanilamide, sulfapyridine, sulfathiazole, sulfadiazine, sulfacetamide and sulfaguanidine in concentrations ranging from 1:5000 to 1:200,000. These were then inoculated with 0.1 cc. per tube, of a saline suspension of the organism, prepared from a 24 hour Sabouraud slant. After 24 and 48 hours incubation, macroscopic growth was apparently equal on media containing sulfonamides, and controls.

AUTOPSY FINDINGS—6-9-43.

External Examination—Body is that of an extremely emaciated Negro of 49 years, displaying marked muscular atrophy of all extremities, as well as an apparently healed sinus tract opening in the lower portion of the right upper abdominal quadrant.

Internal Examination—There is a moderately thick fibrinopurulent exudate over the visceral pleural surface of the right lower lobe of the right lung. The pleural surfaces elsewhere are unaltered and the pleural cavities contain no fluid. The pericardium is thin and almost translucent. The sac contains only the normal amount of thin serous fluid. The peritoneal cavity contains no fluid. There are dense, tough connective tissue adhesions between the cecum, ascending colon and the anterior peritoneal surfaces of the abdominal cavity.

Aorta—The elasticity of the aorta is moderately diminished and its intimal surface is the seat of numerous thin yellowish gray atheromata. There is no distinctive evidence of luetic aortitis.

Heart—Weighs 280 grams. A thin unscarred epicardium overlies a uniformly flabby, dull, reddish-brown myocardium. The mural and valvular endocardium show no lesions of note. The coronary arteries are not prominent but their intimal surfaces do display thin yellowish-gray atheromata.

Lungs—Right weighs 700 and left weighs 375 grams. The bronchi, particularly those leading to the right lower lobe contain thick, tenacious mucilagenous material. The pulmonary vessels show no lesions of note. The right lower lobe presents on cut surface a large irregularly circumscribed, but well defined moderately firm, yellow-gray, glistening mucoid mass 6.5 cm. in diameter which is surrounded by moderately firm reddish-purple lung parenchyma, the cut surface of which is covered with syrupy purulent material. The right middle lobe is sub-crepitant and displays a moderately bloody and moist cut surface. The lower portion of the right upper lobe displays small, moderately firm, grayish-white peribronchial lesions which are slightly raised above the cut surface of the slightly blood reddish-gray parenchyma. The left upper lobe is normally crepitant and displays a dry pinkish-gray cut surface. The left lower lobe is subcrepitant and displays a bloody reddish-brown cut surface.

Lymph Nodes—No lymph nodes are palpable peripherally. The nodes of the para-aortic and mesenteric groups are slightly enlarged, moderately soft and pearly gray.

Spleen—Weighs 110 grams. A thin capsule overlies a moderately firm, uniformly dark brick red parenchyma, the cut surface of which reveals numerous skein-like trabeculae but no follicles.

Kidneys—Right weighs 125 and the left 150 grams. The renal capsules are very thin and adherent. The renal parenchyma bulges when cut. The calices and pelvices are normal. The cortico-medullary boundaries are blurred. The parenchyma is soft, flabby and reddish-brown. The cortical surfaces are finely pitted and scarred.

The ureters are not dilated and appear normal. The urinary bladder displays some slight submucosal hemorrhage but no other lesions of note.

Genitalia—The external genitalia show no

lesions of note. The lateral lobes of the prostate are not unduly enlarged.

G-I Tract—There is a small pedunculated polyp arising from an otherwise normal appearing gastric mucosa. The duodenum and jejunum show no lesions of note the mucosal surface of the terminal ileum, cecum and first portion of the ascending colon displays thin irregular transverse shallow ulcerations. The transverse colon, descending colon and rectum show no lesions of note.

Liver—Weighs 1250 grams. A thin capsule overlies a moderately firm uniformly brick-red parenchyma, the cut surface of which is slightly bloody. Gall bladder and bile ducts—gall bladder has a thin tough greenish-gray wall and its lumen contains a small quantity of yellow bile. The bile ducts are patent.

Pancreas—Pancreatic lobules are normal in size, moderately firm and yellowish-gray.

Adrenals—The adrenal cortices are a grayish-yellowish-brown and overlie moderately firm grayish-white medullary tissue.

Thyroid—Appears normal to external palpation.

Brain—Weighs 1390 grams. The brain is closely applied in the cranial vault. The pachymeninges show no lesions of note. The leptomeninges are flecked with thin mucilagenous greenish-gray purulent material, which is particularly prominent around the larger cerebral veins. There is a large amount of this exudate over the posterior surface of the right cerebellar hemisphere. The vessels of the circle of Willis are intact. There is no apparent evidence of hemorrhage or thrombosis of the brain parenchyma, which, on longitudinal section, shows in the left frontal lobe an irregularly outlined but well circumscribed, moderately firm, glistening mucoid, yellowish-gray mass, approximately 4 cm. in diameter. It is very similar in appearance to the lesion described in the right lower lobe of the lung.

Microscopic

Heart—The muscle fibers show a generalized moderate atrophy with some fraying of the fibers and an increase in lipochrome pigment around the nuclei of the muscle cells. There is an occasional small focal area of fibrosis. There is no evidence of torula in the section of myocardium reviewed.

Lungs—(Fig. 3) The moderately firm, yellowish-gray, glistening, mucoid mass 6.5 cm. in diameter described, grossly displays a supporting structural framework of fibrin strands which are separated by a thin mucoid or gelatinous material. Within the ill-defined areas bounded by the irregular network of fibrin are many diffusely scattered torulae,

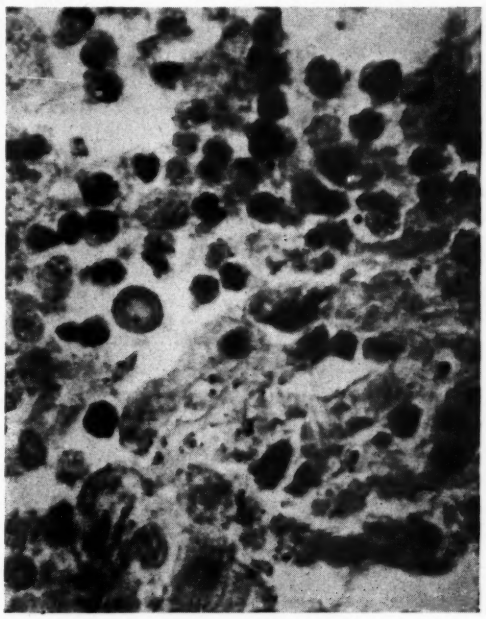

Fig. 3 — Torula in section from lung. Magnification x100.

as well as, oddly enough, what appear to be lipoid-containing macrophages, and an occasional centrally multinucleated giant cell, the cytoplasm of which also has a suggestively lipoid-containing cytoplasm. At the ill-defined borders of this torulae containing mucoid mass, there are no epitheliod cells or other cellular elements suggesting a tuberculoid lesion.

The small moderately firm, grayish-white peri-bronchial lesions described grossly in the right lower lobe are focal areas of bronchopneumonia characterized by alveoli which are filled for the most part with polymorphonuclear leukocytes surrounding diffusely scattered torulae. In addition are present lipoid-containing macrophages, hemosiderin-filled macrophages and an occasional macrophage

showing phagocytosis of leukocytes. The bronchiolar lumina contain a similar type of exudate and small aggregates of other bacteria in addition to scattered torulae. These clumps of other bacteria are also present in the alveoli.

There are several areas in the right upper lobe of the lung in which these focal areas of bronchopneumonia have coalesced to form a confluent bronchopneumonia. The pleural surface of the right lung exhibits a thin fibrino-purulent exudate containing no torulae.

Lymph Nodes—The architecture of the mesenteric and para-aortic lymph nodes in general is well preserved. The lymph sinuses are slightly dilated and contain reticulo endotheliel macrophages. No torulae are seen any place in these nodes and there is no evidence of Hodgkin's disease.

Spleen—The sinusoids are prominently dilated and contain red cells and many hemosiderin filled macrophages. No torulae are seen. There is one small healed focal tuberculoma which was not observed grossly.

Kidneys—The glomeruli show no changes. The tubular epithelium shows moderate parenchymatous degeneration. There is moderate congestion of the renal capillaries. No torulae are seen. There is moderate arteriosclerosis of the interlobular arteries.

G. I. Tract—The small pedunculated polyp of the gastric mucosa is made up of widely dilated gastric glandular acini showing a low columnar epithelium and containing a gelatinous mucoid material within the lumina of the glands in which is an occasional torula.

An ulcer removed from the ileum shows a thick, central, necrotic slough, has undermined overhanging edges of normal mucosa and scattered small shrunken torulae at its base.

Liver—The architecture is not altered and the hepatic cells show only a slight degeneration. The medullary cells are well preserved and there is no evidence of torula.

Brain—(Fig. 4) The brain parenchymal cells show moderate degenerative changes. The cerebral vessels are dilated and blood-filled and there is evidence of moderate cerebral edema. The solitary lesion in the left frontal lobe has the same histological appearance as that described under lung; with the exception that small blood vessels within the lesion show a thin collar of monocytic cells and in some instances a collar of lipoid containing macrophages. Particularly outstanding again is the lack of any inflammatory cellular change at the juncture of the lesion with the cerebral parenchyma.

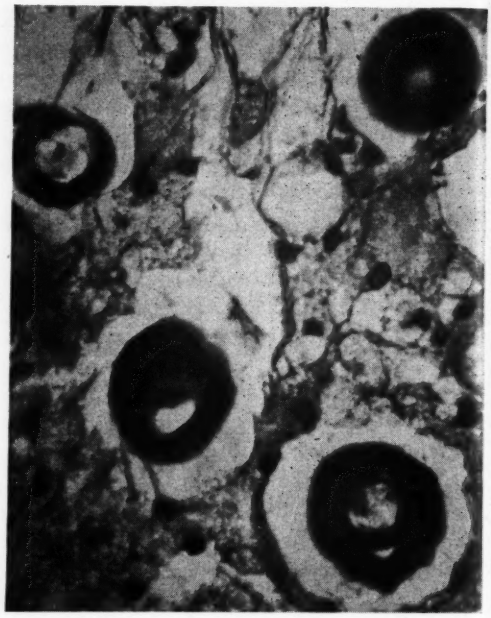

Fig. 4 — Torula seen in section from meninges. Magnification x900.

In addition to the large solitary lesion several smaller focal collections of torulae are seen. Only one of these areas has provoked a cellular reaction and in this instance the plasma cell is the predominating cell.

HISTOLOGICAL SUMMARY

1. Larger mucoid gelatinous cerebral and pulmonary lesions were seen in this case than have been described in the literature up to this time.
2. There was a diffuse and focal bronchopneumonia in addition to the large gelatinous lesions in which torulae are present.
3. A polymorphonuclear leukocytic cel-

lular reaction was present without any evidence of the so-called tuberculoid reaction recorded by several authors.

4. There were torulae lesions in the stomach, ileum, caecum and ascending colon. This is in itself unusual and has only been reported in the literature in about fourteen other instances.[20]

5. There is no evidence in the lymph nodes of Hodgkin's disease or torula.

COMMENT

Torula histolytica infection of the meninges with or without involvement of other viscera is almost universally fatal. A number of patients have, however, lived from many months to a few years. Sulfonamides have been used in very few of the reported cases.[9,16,17,19]. Conant et al,[21] in an excellent summary of torula infections, report two cases in which sulfadiazine was used, one of which succumbed, the other was continuing to improve at the time of the report. Both these patients, however, had only primary pulmonary involvement. In only one other case[9] did this type of chemotherapy seem effective, and even in that instance the patient had been apparently well for only one month prior to the date of the report. The organism from another case has been studied carefully in vitro and found refractory to sulfonamides.[18]

In the present case, no effect was observed after prolonged heavy dosage of sulfonamides. Torulae were found at autopsy to be very wide spread, involving the brain, meninges, lung, stomach, cecum, and ascending colon. The involvement of the gastro-intestinal tract raises the interesting speculation that in this instance the original torula infection may have occurred through the long-standing fecal fistula. In this patient the disease may have been too far advanced when treatment was started to expect any marked response. However, the growth of the organism was also found to be entirely uneffected by six different sulfonamides in carefully controlled in vitro experiments. It seems then that the sulfonamides are not effective against most strains of torula histolytica. Whether penicillin will be effective, as suggested by Dawson et al,[19] remains for further clinical trial to determine.

CONCLUSION

1. A case of torula histolytica (cryptococcus hominis) infection involving the meninges, brain, lung, and gastro-intestinal tract is reported, with autopsy findings.
2. Sulfathiazole and sulfadiazine were found to be totally ineffective against torula histolytica in this case, both in vitro and in vivo.
3. From data available at present it is probable that sulfonamides are ineffective therapeutically against most strains of torula histolytica.

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TULAREMIA: A CASE TREATED WITH STREPTOMYCIN*

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Heilman[1] first reported that mice experimentally infected with lethal doses of *Pasteurella tularense* recovered completely when streptomycin was given subcutaneously in divided doses. Following this work, Foshay[2] reported seven cases of human tularemia successfully treated with relatively small doses of parenterally administered streptomycin. A noticable feature of his report was the greatly shortened duration of illness.

Recently the opportunity of treating a case of tularemia was presented. A supply of streptomycin was obtained for therapeutic trial from E. R. Squibb and Sons, released through the courtesy of Dr. Chester S. Keefer, Chairman of the Committee on Chemotherapeutics of the National Research Council.

CASE REPORT

Mrs. Mary G., a 48-year-old graduate nurse, first developed symptoms on November 26, 1945, 24 hours after cleaning a rabbit the "dogs caught." On the previous day, the patient sustained a nail-file puncture wound beneath the right thumb nail.

Prodromal symptoms included generalized body aches, slight nausea, chilliness and a fever of 99.4° F. These increased in severity and on the following day the right thumb was red, swollen and painful. Signs of lymphangitis and lymphadenitis were apparent and involved the forearm, epitrochlear, axillary and supra-clavicular nodes. Six days after onset the patient was prostrate, with all symptoms markedly exaggerated and a temperature of 104.4° F.

At this time, December 2, 1945, the patient was hospitalized and penicillin therapy was instituted. After the administration of approximately 2.0 million units of the drug without response, the patient was then placed on sulfadiazine therapy. Thirty grams of this drug was given without appreciable response. Continuous magnesium sulphate compresses during this period resulted in a localization of the thumb lesion, which was incised and drained, with relief in pain and some amelioration of the lymphatic infection. During this period the temperature remained elevated, with slight daily variations of 1-2 degrees F.

On the seventh day of illness an irritative, non-productive cough developed. An x-ray of the chest was reported negative except for "pleural thickening at the left base." On the 14th hospital day the temperature dropped to 98° F., remaining between 98-100° F. for the next 5 days. The patient was then discharged, improved, on her 19th hospital day, with a diagnosis of influenza and infected wound of the right thumb. The laboratory studies performed during this admission showed a slightly elevated leukocyte count and an albuminura with red and white blood cells present.

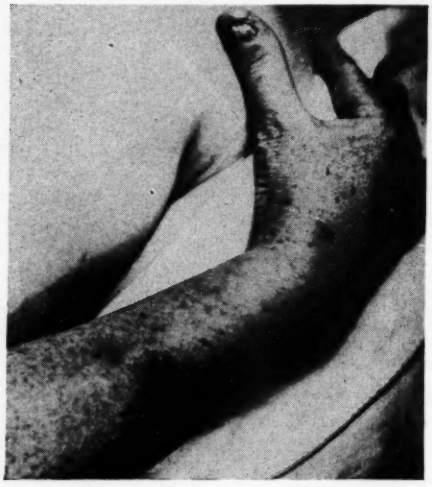

Fig. 1 — Photograph showing site of primary lesion and miliary abscesses of arm, before streptomycin therapy (2nd hospital admission).

The patient had remained at home since January 23, 1946 (57th day of illness), when she was first seen by this author. She gave the history previously noted, and reported daily temperature fluctuations reaching 101° F., since her hospital discharge. Malaise, anorexia and lymphadenitis made it impossible for her to perform routine household duties without frequent rest periods throughout the day.

Physical examination was essentially negative, except for the presence of four pea-sized, fluctuant abscesses on the volar aspect of the

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right forearm; several enlarged, indurated, palpable axillary nodes; and a fluctuant mass about the size of an orange, pointing just above the mid-portion of the right clavicular region.

On January 26, 1946, the abscess was incised and drained under general anesthesia. Approximately 6 ounces of thick, grey pus was evacuated and the cavity was packed with plain gauze. The operation wound healed completely in two weeks. The pus and a blood specimen were submitted to the laboratory for study. On January 26, 1946, blood for culture and agglutinzation, and pus from incisional drainage were received. These materials were cultured on blood agar plates (incubated in 10% CO_2), thioglycollate broth and Difco-glucose-cystine-hemoglobin agar slants. Patient's serum agglutinated *Pasteuralla tularense* antigen through a dilution of 1:1280. No growth was obtained on any media after 10 days' incubation.

Following the operation, the patient's temperature ranged from 98-99° F. and there was some clinical improvement. However, in early February, an axillary gland broke down, which necessitated incision and drainage on February 18th (83rd day of illness). A similar specimen of pus was submitted to the laboratory, which reported that "guinea pigs inoculated subcutaneously with pus obtained January 30 and February 18, 1946, remained well after 20 days' observation.

The patient's condition remained unchanged and in March another axillary gland became swollen and inflamed, with no signs of fluctuation. On March 27, 1946 (120th day of illness) the patient was again hospitalized, and after preliminary laboratory studies, streptomycin therapy was instituted.

Patients' admission laboratory studies showed a normal urinalysis, an excretion of 27% phenolsulphonphthalein in 15 minutes, a sedimentation rate of 22 mm. in 60 minutes, and a blood count of 5.0 million R. B. C., 14.8 grams hemoglobin, 5,400 W. B. C., and a normal differential count.

On March 27, 1946, 4.0 gm.* streptomycin sulfate were received for therapeutic trial.

* 4.0 Gm. is equivalent to 4,000,000 units, when compared with the pure base; therefore 1 unit = 0.001 mg., or 1 microgram.

At Dr. Keefer's suggestion, each ampule was diluted with sterile normal saline to contain 60 mg. per ml., and 1 ml. was administered intramuscularly every 3 hours around the clock, for 8 days. Blood for assay was obtained at 1, 2 and 3-hour intervals each day (at 8 p. m., 3 p. m. and 7 p. m.), along with a 24-hour urine specimen for assay and routine analysis. Blood and urine were assayed for streptomycin content by the technic of Price, Nielsen and Welch[3] of the Food and Drug Administra-

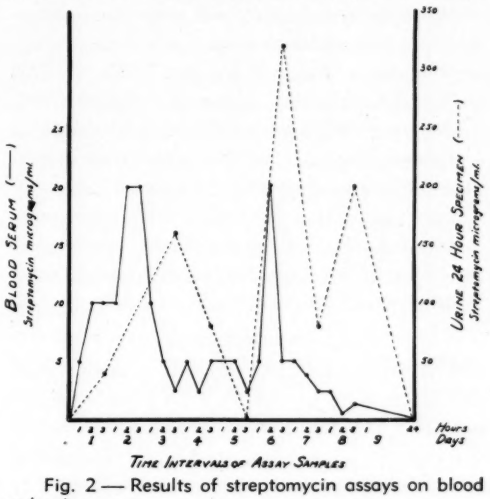

Fig. 2 — Results of streptomycin assays on blood and urine.

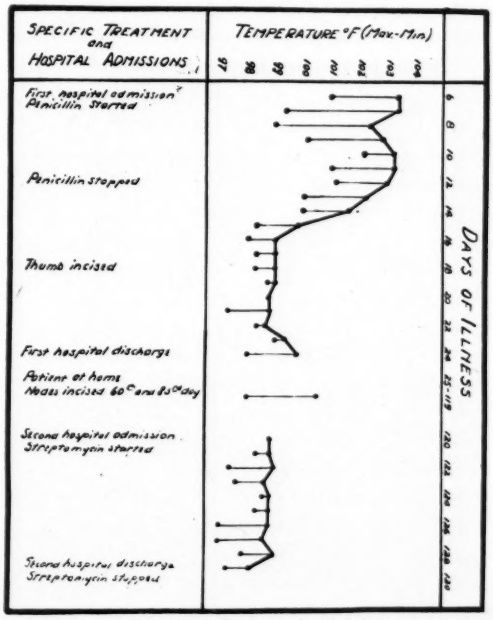

Fig. 3 — Course of illness.

tion, employing a tube dilution technic and *Bacillus circulans* as the test organism. Streptomycin standard was prepared from appropriate dilutions of the administered drug.

As indicated in the following chart (Fig. 2) blood serum levels ranged between 0.6-20.0 micrograms per ml., and urine levels between 40-320 micrograms per ml. This range is in accord with previously reported figures, Reimann[4] having noted that there were irregularities in levels obtained with similar dosage in the same and in different patients. Calculated on a percentage basis, the urinary recovery figures average 41.5% (11-133%). This is slightly lower than reported recoveries (50-65%), but only undiluted and 1-10 dilutions were assayed. No streptomycin was detectable in the blood or urine 24 hours after medication was stopped. Daily urinalyses were negative for R. B. C. and albumin, the specific gravities varied from 1.009-1.019, and 24-hour volumes from 1350-2310 ml.

COMMENT

The objective criteria by which we observed the alterations in this disease process under streptomycin therapy were indeed dramatic. At the end of the first 48 hours' administration, the appearance of the arm was greatly improved. All erythema and induration had disappeared in the forearm, and the small abscesses had regressed completely. The axillary glands were decreasing in size except for one, which now showed signs of fluctuation, with absence, however, of inflammatory signs. Slight residual pain in the arm persisted, but the patient stated that, for the first time in several months, she "felt more like herself." At the end of the first 72 hours of treatment, the temperature was normal and continued thus, except for two occasions when there were elevations to 99° F. Therapy was completed on the 8th hospital day (131st day of illness) and the patient was discharged afebrile and generally improved. The only reaction to the drug was a mild, transient nausea, persisting for one hour after each injection for the first 48 hours of treatment.

On April 12, 1946 (139th day of illness), the fluctuant axillary node was incised under local procaine infiltration of the overlying skin, and approximately 1 oz. of clear, straw-colored fluid was evacuated, in sharp contrast to the previously described discharge. When last seen on June 3, 1946, the patient was asymptomatic, and there was no local or systemic evidence of the infection.

SUMMARY

1. A case of human ulcero-glandular tularemia with a negative tularemic pneumonia is presented.
2. Refractoriness to full therapeutic doses of both penicillin and sulfadiazine was demonstrated.
3. After the 120th day of illness, a prompt clinical response was effected by the intramuscular injection of 4.0 gm. streptomycin sulfate (60 mg. every 3 hours), administered over an 8-day period. Substantial blood serum levels were attained.
4. Apart from a mild transient nausea, there were no local or general reactions from the use of streptomycin in this case.

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MYXEDEMA WITH CHOLESTEROSIS AND MASSIVE PERICARDIAL EFFUSION

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CASE REPORT

The patient, M. J., a white female, age 57, was admitted to the Delaware Hospital on April 19, 1945, with abdominal swelling, ankle edema, cyanosis of the upper extremities and head, and marked exertional dyspnea. In 1939, the patient was studied in another hospital, with complaints of indigestion, constipation and infected kidney. In February, 1944, she went to her family doctor with the complaint that her skin bruised easily on the slightest touch and that it constantly itched. She stated that for 5 years that she had become short of breath on ordinary housekeeping duties and that for the previous 6 months this

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had increased so that she found it difficult to walk two blocks up a slight grade of 10 to 15 feet and that on climbing stairs she always had to rest once or twice. She reported a persistent cough. She also complained, as previously, of constipation which required a laxative every few days and she was constantly troubled with abdominal gas. Her appetite was always good. Physical examination at this time revealed a somewhat childish, middle aged female, with a husky, metallic voice. The lips and fingernails were cyanosed. The heart was slightly enlarged to the left, rate 120. Blood pressure 160/100. No murmurs noted. Her tongue was large, red with prominent papillae, furrows and some fissures. The skin was thin and dry, parchment-like with numerous bruises in various stages of recovery.

Fig. 1 — Heart and pericardium. Arrow points to cholesterol deposits.

In April, 1944, a B. M. R. was reported minus 20. Patient was placed on 1 grain of thyroid daily with phenobarbital and multiple vitamins. In September she was placed on 1 grain of digitalis, 5 times weekly. She appeared to be responding and was able to get around the house and outside. In January, 1945, she had become greatly cyanosed, dyspneic and had moderate edema of the ankles. The heart sounds were reported indistinct and the liver 4 fingers below the costal margin. She was treated with digitalis and bed rest. She seemed to improve with bed rest until March, 1945, when the heart sounds were reported feeble and distant. Thyroid medication was stopped and hospital study recommended, this was refused as had been previously. At this time there was marked ascites. The left chest was flat through the mid-scapula. The blood pressure had fallen to 120/90.

After cardiac consultation, in April, 1945, the patient was admitted to the hospital on April 19, 1945. Admission physical examination revealed a blood pressure of 104/80; temperature, 96°; pulse, 80; respirations, 22. The skin was brawny, tense and edematous. Extremities were short and spade-like. The voice was husky; left chest was flat to percussion; there was marked ascites; moderate dyspnea; cyanotic lips; pale mucous membranes; weak pulse; distant heart sounds. Urinalysis—Sp. Gr. 1.030; cloudy; acid; albumin, sugar and acetone negative; W. B. C. 20-30. The blood count revealed R. B. C., 4.4; Hemoglobin, 14.1 gms.; W. B. C., 5,300; Lymphocytes, 18%; Polys Seg, 76%; Polys Non-Seg. 3%; and Monocytes, 3%; Urea Nitrogen, 13.4 mg.%; Blood Sugar, 129 mg.%; Total Protein, 6.4 mg.%. On April 20, 1945, paracentesis yielded 3,120 cc. of clear, watery,

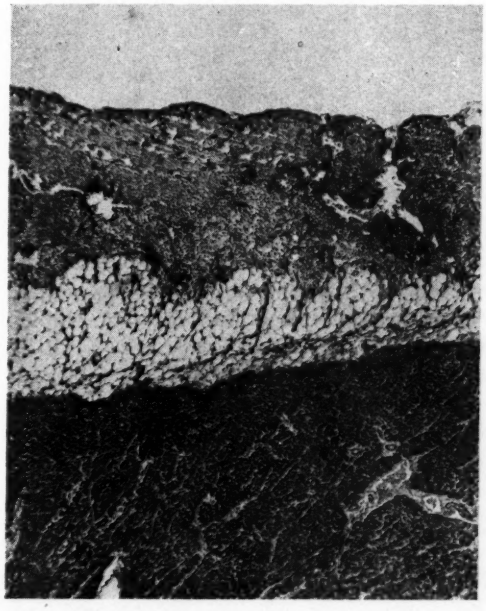

Fig. 2. — Heart.

greenish fluid which sparkled in bright light and appeared to contain fine, yellow, crystalline material. The patient's temperature remained sub-normal, cyanosis deepened and she died on April 22, 1945.

AUTOPSY FINDINGS

Autopsy performed on April 22, 1945, five hours after death, revealed a myxedematous-

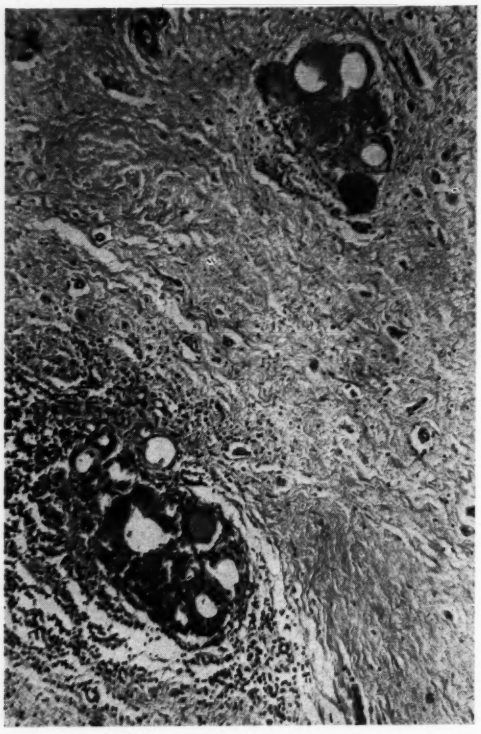

Fig. 3 — Thyroid, Riedel struma.

appearing female with coarse features; dry, rough skin; no abnormal loss of hair; short spade-like extremities; pitting edema of the extremities and a distended abdomen. Internal examination revealed 500 cc. of fluid in the abdomen and 200 cc. in the left pleural cavity. The chest was distorted by a massive pericardium which practically filled the cavity and measures 23 cm. across. The pericardium contained 4000 cc. of dark, green, fluorescent fluid containing bright, sparkling, yellow cholesterol crystals, which chemical examination showed 76 mg.% cholesterol. The heart and pericardium weighed 750 grams. The heart itself was not enlarged, but smaller than normal, the pericardium was greatly thickened and both pericardium and epicardium were covered with soft, orange-yellow, cone-like deposits of cholesterol.

The heart muscle was dark brown in color and seemed to have a normal tone. The mitral valve showed slight fibrous thickening. The coronaries appeared normal and the aorta showed scattered atheroma. The lungs showed left compression atelectasis and right patchy edema and atelectasis. The liver showed chronic congestion and fatty changes. The gall bladder was filled with numerous 2-3 cm., soft, black stones. The kidneys showed slight nephrosclerosis. Neck dissection revealed no structure which was identifiable immediately as thyroid, but subsequent examination of the specimen removed, revealed 2 firm, grey-white, gristly structures about the same size as thyroid. Sections of the heart revealed lipoid granulomatous reaction of the epicardium.

Scarlet R stains of the heart revealed two varieties of fat present. Examination of similar tissue under the polarizing microscope showed double refractal crystals in the epicardium and myocardium. Section of suspected thyroid confirmed identity and revealed extensive fibrous replacement which Dr. Shields Warren of Boston, in a personal communication, diagnosed as Riedel's struma.

DISCUSSION

The findings in this case are unusual. Pericardial effusions over 2000 cc. are not reported. There are only a few recorded cases of so-called myxedema heart in which cholesterol content has been measured.[1] These results are similar to ours and are accompanied with a slight elevation in the blood cholesterol. Similar cases of cholesterol pericarditis are almost impossible to find in the literature. Similar skin bruising as seen in this case was reported by Feasley.[3] The thyroid sections are remarkable for their lack of identifiable thyroid tissue.

The case adds another to the accumulating series which relates the existence of the so-called myxedema reversible heart.[1,2,3] It is becoming more apparent that the changes in cardiac size in myxedema under thyroid medication

are due to the diminution of pericardial effusion.

As there have been very few myxedema cases come to autopsy, this case is most interesting.

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LYMPHOMA OF THE SMALL INTESTINE IN CHILDHOOD*

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Lymphoma of the gastro-intestinal tract is an uncommon disease. It accounts for about 1.9% of all malignancy of the digestive system.[1] Cutler et al,[2] make the following statement: "...a neoplasm of the intestinal tract in an infant or child should be considered lymphosarcoma until proven otherwise..." This statement is justified because of (1) the rarity of carcinoma of the bowel in children, (2) the infrequent involvement of the small intestine in carcinomatous change, (3) as Raiford[3] has shown, lymphoma shows no predilection for any certain age group.

The majority of lymphomas of the small intestine are believed to arise in the single small lymph follicles of the bowel. These follicles are plentiful in the ileum, fewer in the jejunum, and almost non-existent in the duodenum. Proportionately, the frequency of lymphoma follows the location of the greater distribution of the solitary follicles.

Warren and Lulenske[4] stress the distinction between local lymphoma and the generalized form of the disease. Lymphoma may be a solitary growth and remain solitary for many years. In one series studied it was concluded that metastasis to regional nodes and extension occurs late in the disease, if at all. It must be remembered, however, that these tumors may be only the first manifestation of a neoplastic imbalance of all of the lymphoid tissues. The distinction between these types of lymphoma cannot be made grossly or microscopically by the study of a solitary growth from the intestine. The beginnings of a generalized lymphomatous process and a solitary tumor present the same picture. In the series studied by Warren and Lulenski prognosis for the solitary growths was little better than for generalized lymphoma. The life expectancy

Fig. 1 — Lymphosarcoma of the small intestine in childhood.

in cases of solitary tumor, which have been completely removed by surgery, have apparently resulted in complete cure.

CASE REPORT

J. H., a ten-year-old, white male, was admitted to the Delaware Hospital with a chief complaint of abdominal pain of one month's duration. He had been operated on about one month prior to admission for appendicitis in another state. Following this operation, he continued to have abdominal pain and vomiting, and with a remission of these symptoms he was sent home. At home, however, the child continued to have dull, aching, occasionally sharp, epigastric and lower right quadrant pain. He also complained of a flatu-

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lence and a tendency to constipation. The patient had lost 10 pounds since the onset of his illness.

On admission physical examination revealed a temperature of 99.6°; pulse rate, 109; and

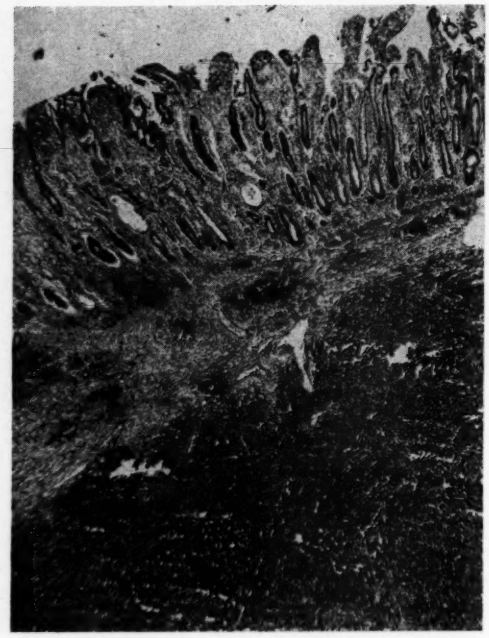

Fig. 2 — Lymphosarcoma of the small intestine in childhood.

respiration, 20 per minute. The positive physical findings were limited to the abdomen, which was moderately distended and tympanitic. Peristalsis was decreased and no masses were palpable. There was no tenderness in any part of the abdomen. A scar in right lower quadrant was noted.

A blood count and urinalysis were within normal limits.

An x-ray examination was unsatisfactory because of retained barium from a previous examination. However, the roentgenologist's opinion was that an obstruction existed in the lower end of the small intestine.

The symptoms of obstruction increased and the weight loss progressed until 30% weight loss existed. Surgery was postponed until the fifteenth hospital day in an attempt to relieve the distention and locate the obstruction with a Miller-Abbot tube. An effort was made to build up the child's general condition with whole blood, intravenous fluids, and vitamins. On the fifteenth day the abdomen was explored. On opening the peritoneal cavity, a small amount of free fluid was noted. The small bowel was distended down to a point 18 inches above the ileocecal valve, where there was a mass partially occluding the lumen of the bowel and extending through the serosal coat. Below the mass, the bowel was collapsed and normal. The distended bowel was markedly reddened and there were numerous soft, movable, small nodes throughout the mesentery. The ileum and colon were normal.

The involved portion of the bowel was resected, and an end to end anastomosis was done. Five grams of sulphanilamide were placed in the peritoneal cavity and the abdomen was cleared.

The pathological examination revealed an oval, nodular, edematous, soft tumor, measuring 4.5x3x1 cm., arising in the small intestine. The surface of the mass was covered with necrotic debris. The tumor extended through the wall and appeared as slightly elevated nodules on the serosal surface. The growth produced a partial obstruction involving all but 2 cm. of the lumen of the intestine. Above

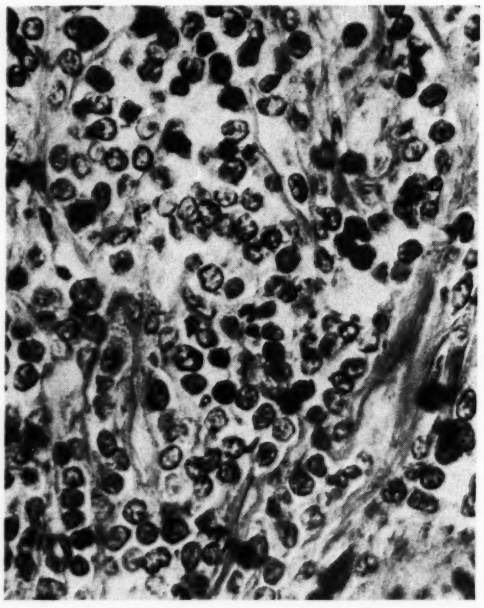

Fig. 3 — Lymphosarcoma of the small intestine in childhood.

the tumor, the intestine was dilated and showed deep ulcerative and hemorrhagic inflammation.

Microscopic examination revealed an infiltrating tumor arising in the wall and destroying the mucosa. The tumor extended completely through the wall and consisted of solid sheets of rather uniform, hyperchromic, large, nucleated, lymphocyte-like cells with a scanty cytoplasm. Throughout were narrow, fibrous stromal bands. The diagnosis was lymphosarcoma (small round cell lymphoma) of the small intestine.

The child made an uneventful recovery and was discharged on the fourteenth post-operative day. A two-month follow-up found the child to be in excellent health with a 30 pound weight gain.

The obstruction caused by lymphoma is not usually acute. The growth is not "napkin ring" and does not ordinarily obstruct the fecal stream. The involvement and destruction of the submucosal nerve plexuses with resultant loss of peristalsis simulates true obstruction.[5] In early childhood tumor of the ileum may cause intrussusception.

The classification and relationships of the various neoplasms of the lymphoid tissues are beyond the scope of this paper. For that reason, the term "lymphoma" has been used throughout. This is an all-embracing term that includes all of the malignant neoplasms of lymphoid origin. The definition of lymphoma by Gall and Mallory[6] "...a tumor of mesenchymal origin in which the cells tend to differentiate into cells of the lymphocytic series..." is widely accepted. The group may be further sub-divided on the basis of cytology. Four subgroups are generally recognized: (1) small round cell; (2) large or reticulum cell; (3) Hodgkin's lymphoma; (4) giant follicular lymphoma.[5]

The prognosis of lymphoma of the bowel is guarded. At operation, if only a solitary growth is found, there is no way to differentiate between local and beginning generalized lymphoma. Not infrequently regional metastasis, not evident at operation, follows removal of the tumor.

The treatment of lymphoma of the gastro-intestinal tract is surgical excision followed by x-ray surgery. However, sufficient time must be allowed for good healing of the suture line before radiation is begun.

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RENAL HEMANGIOMATA*

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CASE I

About fifteen years ago a young man, 20 years of age, came to my office for treatment of an acute specific urethritis. During the course of treatment a small "blood tumor" was discovered on the glans penis, and its removal affected by electrocoagulation. Nine years later he returned with gross hematuria. Hospitalization was advised but refused. Within the year, he requested hospitalization, and cystoscopy traced the bleeding to the left kidney. With the previous history of angioma of the skin and intermittent hematuria, a diagnosis of renal hemangioma was made. Left nephrectomy followed on 2-13-41.

Specimen of kidney measured 10x6.5x3.5 cm., and showed slight fetal lobulation. One pole showed dark serosa and an aberrant vessel was attached to this pole, 2 cm. from the mid-portion of the hilum. Near the opposite pole, a wedged shaped, pale infarct, measuring 3.5x3.5 cm. was present. Section showed, at the apex of the infarcted area, a finely, honeycombed, hemorrhagic structure which connected with the calyx. The opposite pole showed deeply congested structure. On microscopic examination sections from the honeycombed, cystic tissue showed dilated, blood-filled spaces separated by narrow, fibrous bands, and lined by flattened endotheliel cells. In addition to the hemangioma the surrounding tissue showed evidence of glomerulonephritis and congestion.

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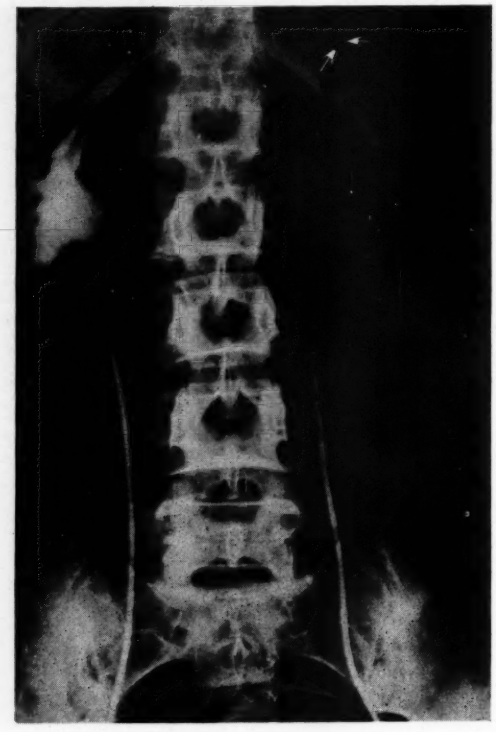
CASE II

A married woman, 39 years of age, was referred with gross hematuria and ureteral colic of four days' duration. Bilateral retrograde pyelography revealed normal filling of



Case II — Fig. 1

the right renal pelvis, and the left showed narrowing of the superior major calyx with some displacement medially. This finding suggested renal tumor.

At operation a normal appearing kidney was removed.

The kidney measured 11x6.2x4.3 cm. The attached ureter showed normal diameter and measured 5 cm. in length. Ureteral mucosa normal. Pelvic mucosa showed a submucosal hematoma which measured 2x1 cm. Gross section showed a portion of this hematoma to consist of hemorrhage along the pelvic mucosa measuring 1 mm. in thickness. Distal to the hematoma, the renal parenchyma showed interstitial hemorrhage over an area approximately 1 cm. in diameter, associated with a finely cystic structure of the tissue. The microscopic examination showed cavernous spaces containing thrombic and free blood. The renal pelvis showed the hemorrhage to have elevated the mucosal epithelium.

DISCUSSION

Dorman and Fowler in the *Journal of Urology,* April, 1946, state that about 51 clinical cases of renal angiomata have been reported in the literature to date. Both the general practitioner and urologist see cases where the cause of hematuria is obscure. Consequently some of these cases are likely to turn out as angiomata of the kidney. When other possibilities are largely excluded, such as stone, tuberculosis, urinary tract infection, typical tumor pyelogram, then hemangioma seems a most likely diagnosis, particularly if the patient is under 45 years of age. Glomerular nephritis may complicate the picture. A renal infarct is less likely to do so, and usually occurs in a later decade. The presence of skin angiomata may have great significance in the presence of intermittent hematuria and has led us to a preoperative diagnosis in Case I .

Dean and McCarthy in the Transactions of the American Association Genito-Urinary Surgeons, Volume 33, 1940, made a preoperative diagnosis of renal hemangioma in a patient exhibiting multiple hemangiomata of the skin. A history of recurrent hematuria (gross) over the years in an otherwise well-nourished individual under 45 years of age should suggest renal angioma.

Frank C. Hamm in the *Journal of Urology,* February, 1946, reports an interesting case of a 34-year-old infantryman, where a diagnosis of neoplasm of the left kidney was made, but because of the doubtful ability of the right kidney to support life, resection of the upper pole of the left kidney was decided upon. The resected area proved to be an angioma. This case teaches caution and conservation and the common routine of removing an entire kidney is subject to criticism where the preoperative diagnosis is somewhat confused and especially where on exposure at operation, the external appearance of the kidney is normal. Dorman and Fowler recently had the courage to open the kidney as they felt that they were most likely dealing with a benign lesion.

SUMMARY

Two cases of renal hemangiomata are reported. One of the cases displayed intermittent hematuria and skin angioma, and was diagnosed preoperatively.

In the absence of renal tuberculosis, urinary calculus, urinary tract infection and urographic evidence of typical malignant tumor, hemangioma is a most likely diagnosis, particularly in individuals under 45 years of age.

Conservatism by renal resection rather than nephrectomy is advocated in cases where the diagnosis is uncertain and especially where on exposure, the kidney appears normal.

Rh SURVEY

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Since January, 1945, the Delaware Hospital has performed 1,890 Rh typings, obtaining 11% negative. Routine examinations are performed with 85% serum and special studies utilize additional 75% and 30% serums. Antibody titrations use human, 4-0 Rh_1, and 4-0 Rh_2 indicator cells. Early anti-Rh antibodies are demonstrated by serial saline tube dilution. Late or blocking antibodies are demonstrated by replacing saline with 30% bovine albumin, following the methods of Dr. L. K. Diamond.[1]

Before August, 1945,[2] two typical cases of hemolytic anemia of the newborn were handled. The first case, Bi, had a normal delivery in 1938, followed by three typical erythroblastic stillbirths. She had received no transfusions. In January, 1945, at eight months of pregnancy, a suggestion of Rh antibody was found. Delivery was electively induced. The infant was jaundiced, edematous, had a large liver and spleen, and a total nucleated count of 55,000, with 65% nucleated red cells. The hemoglobin was 4.5 grams. Transfusions were started immediately with the mother's washed red cells and followed subsequently with type 4-0, Rh negative neutralized blood. Subsequent check by Dr. L. K. Diamond, of Boston, who has kindly re-evaluated most of our studies, revealed anti-Rh agglutinins present through a titer of 1:128. The child showed red cell regeneration and reticulocyte rise on its twentieth day, which reached 3.3% at discharge on the forty-seventh day. At the fifteenth day, over 90% of the child's blood was Rh negative in type. The child has done well and is in excellent health today.

The second case, Ru, had a normal Rh positive delivery in 1941. No history of transfusions. In April of 1945, she delivered a jaundiced baby, with 19.1 grams of hemoglobin, total nucleated count 20,100, with 15% nucleated red cells. The jaundice deepened, the spleen became palpable, and the hemoglobin dropped to 13.8 grams. The mother's serum revealed anti-Rh agglutinins 1:64, together with an anti-Rh blocking substance. Following a similar transfusion course given Case I, this child has done well.

In August of 1945, a routine titration program on Rh negative women was instituted for patients in their second pregnancies, or those who had a stigmata or previous reactions. Since that time, we have had 1,182 births at the hospital and have done 29 antibody titrations, 23 of which have proven negative.

Of the six positive titrations, two were typical hemolytic anemias.

1. E. C. represents one of the complications of elective early delivery. No history of transfusions. A premature death in 1935, a living child in 1937, an erythroblastotic in 1941, a miscarriage in 1943. Titration revealed low titer blocking agglutinins. The child was electively delivered prematurely, had slight jaundice and edema. Hemoglobin was 13 grams. The child was transfused with 80 cc. of mother's washed red cells and did well for five days, when it died of aspiration atelectasis.

2. O. P. had no history of transfusions. Had a normal Rh positive pregnancy in 1939. In 1946 a titration revealed increasing blocking antibodies reaching a point of 1:32. At birth the child, Rh positive, had a hemoglobin of 10 grams. Liver and spleen were slightly enlarged. There was slight jaundice on the third day. Transfusions of Rh negative blood were started, and at three months of age, the baby is well.

The following case presents some of the interpretive problems dealing with this subject.

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3. R. K. had an Rh positive pregnancy in 1939, at which time she received one Rh positive transfusion. Routine check before second delivery revealed late agglutinins which remained at a level of 1:32. Because of mechanical difficulties in the first pregnancy, the child was delivered at term by Caesarian section and found to be Rh_1 and has been perfectly normal. Sensitization did not occur in this case, as predicted when the titer did not rise.

Mixed or heterozygous parentage are illustrated by Cases 4 and 5.

4. M. B. had a history of one living type 4-0, Rh_2 child in August of 1941, with no transfusions or miscarriages. Routine titration revealed presence of late agglutinins, which remained approximately stationary for two months. Normal child, type 2-A, Rh negative was born in July of 1945.

5. M. J. received one transfusion (type unknown) seven years previously. In 1912 she had a normal 4-0, Rh negative child and in 1943 she had a normal 2-A, Rh_2 child. Two stillborn infants. Routine titration revealed presence of late blockings agglutinins. Normal child, type 4-0, Rh negative was born in September of 1945.

6. L. L. is being studied currently. No transfusions, one six and a half-month miscarriage. Titration at the seventh month reveals late blocking antibodies.

The problem of diagnosis is demonstrated by the following two cases.

Mrs. H. B., age 30, was referred to us from another hospital. There had been no previous transfusions. A three-months miscarriage in June of 1943, a normal child in August of 1944, a normal child in August of 1945, who died after two days with a clinical and pathological diagnosis of icterus gravis. Slight edema and jaundice were present. The liver and spleen were not enlarged. Total nucleated count of the child was around 25,000 with 60 to 100 nucleated red cells per 100 whites. Careful check revealed the mother to be type 2-A, Rh_1, Hr positive (heterozygous). The living child, type 4-0, Rh_1, Hr positive. No demonstrable agglutinins were found in our laboratory or in Dr. Diamond's. The type of the last child is unknown, and here where there is a possibility of an Hr incompatibility, as Dr. Diamond stated, "The present negative findings do not rule out erythroblastosis on the basis of Hr incompatibility as clearly as negatives rule Rh incompatibility today."

Another type of problem that is met today with doctors and patients that are over sensitized to this problem, is represented by Mrs. S. In her first pregnancy with no history of transfusions or miscarriages, she delivered a normal, male child which became jaundiced on the fifth day. The mother was negative. The baby and father Rh positive. The child's count revealed 11.6 grams of hemoglobin on the fifth day, which dropped to 10.5 on the twelfth day when the jaundice disappeared. No demonstrable antibodies were present. The child has done well, and both the family and the doctor have been unnecessarily worried. Theoretically, it is difficult to explain the anemia on the Rh basis.

Additional Rh problems related to transfusions have been observed:

1. Patient, age 79, had had seven pregnancies, four miscarriages, and was admitted with a diagnosis of chronic myelogenous leukemia. Routine cross-matching was found incompatible and a check revealed both early and late anti-Rh agglutinins running up to 1:512. She received Rh negative transfusions without reaction. A check on four of the living children revealed three positive and one negative.

2. Our other case, M. C., represents a more serious side of the Rh problem. In 1934, at the age of 22, the patient had her spleen removed for Banti's syndrome. Between that date and November of 1945, she received a total of 25 transfusions, many of which were associated with mild to serious reactions. In November, she received another transfusion for esophageal hemorrhages of what supposedly was her own type, 4-0, Rh positive. This was followed by a chill lasting several hours, and the next day more blood was given without reaction, but the patient's serum was then found to be hemolyzed. Initial check revealed no abnormalities. 200 cc. of Rh negative blood were given with what appeared to be a mild reaction. The patient died of anuria nine days later. Post-mortem studies of the pa-

tient's blood[3] revealed late agglutinins for Rh_1 cells through 1:512, and none against Rh_2 cells. The tests were masked by a prozone throughout the earlier dilations. The second positive donor was typed as Rh_2, explaining the absence of reaction with the second donor. The explanation of the patients' type being credited as positive can only be theoretical. It is apparent that this registered a previous donor's type, and not the patient's own.

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LEIOMYOSARCOMA OF THE STOMACH*

A Case Report

W. W. LATTOMUS, M. D., and
J. W. ALDEN, JR., M. D.
Wilmington, Del.

Mrs. E. F., a white female, aged 47, was admitted to the hospital on 1-21-46 with a chief complaint of vomiting blood.

The patient stated that she had not been well for four years, when she first vomited blood. At that time an abdominal operation was performed. Appendectomy was done and examination of the stomach revealed a gastric ulcer. Further details of this operation were not available. During these four years she had numerous bouts of hemorrhage from the upper gastro-intestinal tract. At no time did she have any abdominal pain. There were intermittant tarry stools and occasional episodes of diarrhea. Nausea was present for only a few minutes preceding the vomiting of blood. During the past year the patient had noticed a gradual loss of strength and appetite, and increasing nervousness.

The patient reported six previous hospital admissions with the same complaints. The treatment was repeated transfusions of whole blood and an active ulcer regime. Her most recent hospitalization was two and one-half months ago, in Florida, following two bouts of hematemesis. She was hospitalized for 10 days at this time and again treated by transfusion of whole blood. A G. I. series done at this time revealed a massive filling defect of the stomach, probably a gastric neoplasm. This was the first x-ray examination done on the patient.

Physical examination on admission revealed a well developed, well nourished white female. The findings were essentially negative, with the exception of the abdomen. There was a right rectus scar. The epigastrium was moderately tender and there was some voluntary muscle guarding but no rigidity. There was some doubt as to whether or not a mass could be felt in the epigastrium. The temperature was normal; pulse rate was 72, the blood pressure was 150/100.

The blood count (1/21/46) showed: R. B. C., 4.0; hemoglobin, 78% (12.3 gm); W. B. C., 5100; lymphs, 23%; mono., 3%; mature polys., 71%; baso., 1%; eosin., 2%.

The urinalysis (1/22/46) showed: color, turbid yellow; sp. gr., 1.018; reaction, acid; albumin, 1+; sugar, 0; acetone, 0; WBC, 5-10 HPF; micro: epithelial cells, loaded.

G. I. x-rays done on 1/22/46, (Fig. 1) were reported as follows: The stomach was greatly dilated and showed large rounded filling

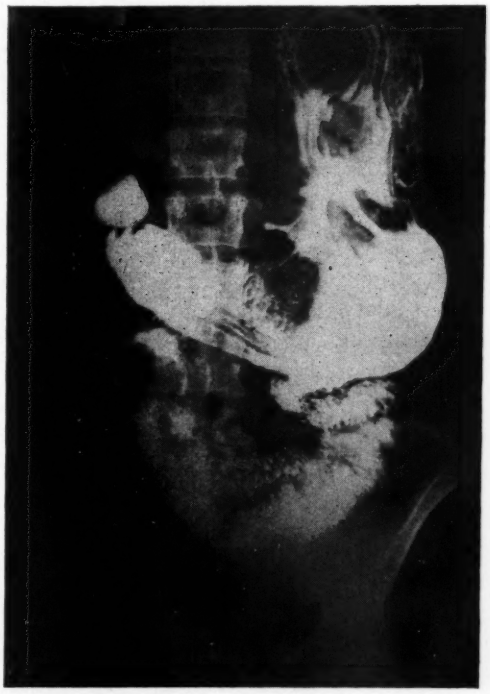

Fig 1 — Case of E. F. Barium-filled stomach, showing large defects caused by polpoid tumor.

* From the Department of Radiology, Delaware Hospital.

defects involving the cardia and fundus of the stomach. On the radiographs these filling defects appear as soft tissue encroachment on the gastric rugae. The rugae are displaced laterally by these masses but are not interrupted. The appearance is that of a mass involving the muscularis rather than the mucosa. The duodenal cup was normal. At five hours traces of barium still remained in the stomach and the head of the meal had reached the ascending colon.

Diagnosis: There is a gross filling defect involving the stomach. Carcinoma is the most common cause for a gross lesion of this kind. Because of the past history and the x-ray appearance, large varices must be considered. This type of filling defect is that frequently seen in sarcoma of the stomach.

The patient was operated upon on 1/29/46 under continuous spinal anesthesia A midline incision was made and the stomach was palpated. The lumen was found to be entirely filled with a hard mass. Total gastrectomy was performed. The patient received 500 cc. of whole blood during the operation, which was done in 2 hours and 19 minutes. The lowest blood pressure recorded was 98/24, and the systolic pressure at the end of the operation was 104.

The pathologist's report on the surgical specimen was as follows (Fig. 2):

Gross: the specimen consists of resected stomach measuring 18 cm. along the greater curvature. The wall of the lessure curvature is completely replaced by a soft nodular tumor, measuring 20 x 10 x 4.5 cm. The mucosa over the tumor is smooth and flat. The tumor bulges into the lumen but does not appear to erode through the mucosa or serosa, but section of the tumor reveals uniform soft gray-white, friable tissue showing occasional areas of hemorrhage and necrosis.

Microscopic: shows a pattern typical of fibrosarcoma or leiomyosarcoma.

Diagnosis: Sarcoma of Stomach.

Postoperatively the patient went into profound secondary shock from which she never responded. Death occurred on the third postoperative day.

DISCUSSION

Reported cases of sarcoma of the stomach constitute about 1 per cent of all gastric malignancies. Most authors classify them in three groups: (1) spindle cell myosarcoma (leiomyosarcoma): (2) lymphosarcoma: (3) miscellaneous round cell sarcomas. Of these approximately one third are of the spindle

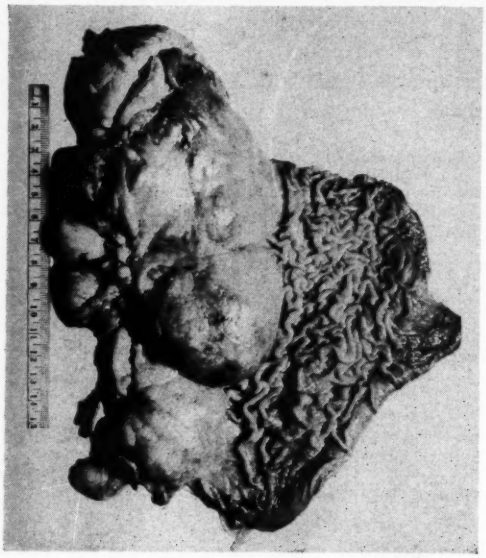

Fig. 2 — Case of E. F. Gross pathological specimen.

cell type. Leiomyosarcoma may be solid or cystic, and frequently are of large size. The tumor may be subserous, intramural, or submucosal. In the case of the latter two, the picture is that of encroachment on the lumen of the stomach while in the former the tumor distorts the stomach by drawing it out into a funnel form. The diagnosis is frequently made late in the course of the disease. Because of its location in the so-called silent area of the stomach in the cardia or fundus, the only symptom may be hemorrhage. At times a mass may be palpable. Metastases to the liver are common, and they are usually bulky and cystic. The course of the disease is relatively long, usually about 3½ years. Radiation has no place in the treatment, which should consist of partial gastric resection.

COMMENT

We are presenting a case of leiomyosarcoma. It is unusual because of the infrequency of occurrence, and the similarity of the radiologic and pathologic pictures. The case also serves to illustrate the importance of thorough

examination, including radiologic, of all patients presenting the symptom of hematemesis.

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REHABILITATION IN THE OBESE BY LIPECTOMY

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GEORGE J. BOINES, M. D.
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Obesity in the female can be a serious cause of incapacity. This is especially true when the abdominal wall is particularly involved, associated with an umbilical hernia. This condition is frequent in the female with the mild diabetic condition which can easily be corrected with a diet whenever followed. Dietary restrictions are important in regulating the weight of these individuals, but these measures are not sufficient to remove the pendulous abdomen which interferes with the patient's movements. Such patients are not able to stoop over, cannot take care of their feet, and obviously cannot tie their shoes. Expensive belts and garments are not only uncomfortable and unreliable, but add greatly to the burden of weight that the victim has to carry around. A circular dermolipectomy and repair of the umbilical hernia offers a means of rehabilitating such an individual. The following case is presented as a typical example.

Mrs. G. P., white female, age 39; height, 4 ft. 11 in. Was always overweight, but became obese after her two pregnancies. An umbilical hernia developed about ten years ago. She often followed special diets for the reduction of her weight and her blood sugar. She never required insulin. In 1941 her weight was 283 pounds. After a 22 day period of hospitalization, her weight was reduced to 275 pounds. On 9/20/45 she was hospitalized for lipectomy. Her weight on admission was 269 pounds; her general physical condition was satisfactory after a brief period of rest and diet regulation.

Operative Record: On 10/8/45, lipectomy and repair was performed by Dr. Jones. An incision was made, starting at the spine and traversing the abdomen to the spine on the

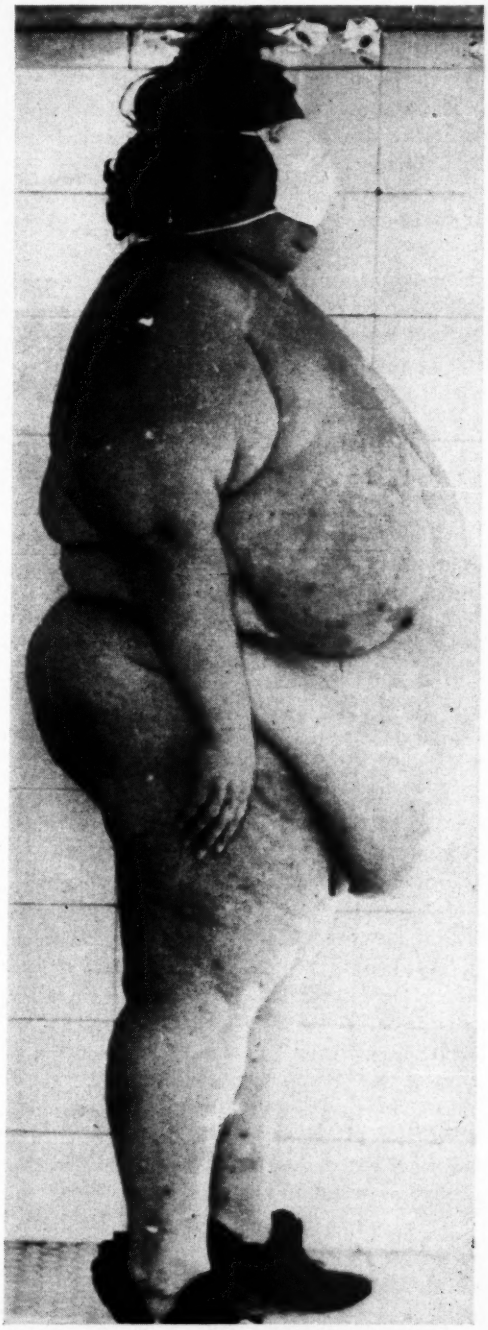

Fig. 1 — 1941, weight 283 pounds. Umbilical hernia.

* From the Department of Surgeary, Delaware Hospital.

other side; a similar incision was made about twelve to fourteen inches lower down and a block of skin, fat tissue and umbilical hernia the shape of a section of an orange was removed. Its weight was thirty-one pounds. The incision was then closed after correcting the hernia.

The patient made an uneventful recovery and was discharged from the hospital on 10/24/45 in good condition. Her weight on discharge was 229 pounds. Within a few weeks she reduced her weight to 212 pounds. She then returned to work and had no difficulty or discomfort in performing her household and many other new duties which she had not been able to do because of the intervening adiposity.

NATIONAL HEALTH BILL DIES

Commenting editorially on the report that efforts to obtain enactment of the national Health bill at this session of Congress have been abandoned by the Senate Committee on Education and Labor, the July 20 issue of *The Journal of the American Medical Association* says:

However, proponents of the bill assert that it will be introduced at the next Congress when it convenes in January. According to unnamed "persons close to the program," the "Wagner-Murray-Dingell bill was loaded with too much controversy for its sponsors to expect it to reach a voting stage before the election year adjournment begins." This statement from the New York Times should be pleasing to the medical profession of the United States, the vast majority of whom have indicated again and again their opposition to the kind of regimentation of medicine embodied in the Wagner-Murray-Dingell legislation. Incidentally, the New York Times says that among the witnesses asked not to appear at the hearings on the bill were representatives of organizations vigorously opposed to the legislation.

As we go to press, the following announcement has also just come from the Committee on Education and Labor:

The Education and Labor Committee voted to instruct Senators Pepper and Taft to draw up a resolution embodying the recommendations of the Committee relative to child health. These recommendations would express the sense of the Committee that a total increase of $31,500,000 for child welfare authorizations should be provided. On July 15 Senators Pepper and Taft introduced Senate Joint Resolution No. 177, amending title 5 of the Social Security Act, to provide for increasing grants to the states for crippled children, maternal and child health and child welfare.

This resolution will go now to the finance committee of the Senate for consideration and then to the appropriations committee of the House for its consideration. In case of favorable action, which at this time seems doubtful, the administration of these additional funds will be under the same regulations and controls as previous appropriations for the Children's Bureau.

By action of the United States Senate, President Truman's reorganization plan becomes effective so that the Children's Bureau will be transferred from the Department of Labor to the Federal Security Agency, where its activities will be coordinated with those of the United States Public Health Service and other governmental agencies having similar functions.

Whatever success has been thus far achieved in controlling tuberculosis is a direct contribution of organized medicine to the welfare of the human race. Critical and querulous comment is rather too commonly heard, charging the medical profession with dereliction of its duty in not suspecting and therefore discovering tuberculosis in its earliest or minimal stage. This criticism is largely unfair, since it is only through the X-ray that the disease can be discovered thus early. Although the X-ray has been in use for a good many years, facilities for its adequate application have only recently been generally distributed. From now on it will take the place it deserves as our outstanding diagnostic medium and be used without limitation by internists everywhere.—Kendall Emerson, M. D. *Hoosier Health Herald,* February, 1946.

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VOL. 18 JULY, 1946 No. 7

INDEFENSIBLE

The action of the Wilmington City Council on June 27th, which raised the annual medical license fee from $10 to $50, has caused a festering sore in the medical profession that will require a lot of political penicillin to cure. The action is indefensible. With a balance of $920,000 in the city treasury, no justification has yet appeared for *any* increase in the business or professional licenses, yet the budgeteers hiked the total to more than double the amount ever assessed before.

No hearings were held. In the press of June 26th came the news that the hike was on and that the voting would come on the 27th. Even so, the President of the New Castle County Medical Society and two members of its Legislative Committee were on hand to protest, but the deal went through according to Hoyle.

The new fees are supposed to be on "an equitable basis." The doctors would not feel so incensed if they really were. The doctor's practice, according to clientele, specialty, etc., involves fifteen to thirty per cent charity work. So, for doing the indispensable medical charity work of the community the medical license fee is multiplied by five. What an unspeakably ungrateful community this has turned out to be! Never before, in the tax history of this city, has such an unconscionable grab been perpetrated. The young medic just back from facing bullets, grubbing along for another start, disgustedly says he'd rather be facing bullets than facing ballots like these. And we used to wonder why and how cynics were made!

This $50 license is not effective till June, 1947. We have more than a hunch that some of the members of Council even now aren't any too happy about the whole affair. The proper and reasonable thing now is for Council, who upped the fees all too hurriedly, to repeal or revise than more leisurely, and more equitably. The Legislative Committee of the New Castle County Medical Society should immediately petition that this be done.

BOOK REVIEWS

Electrocardiography in Practice. By Ashton Graybiel, M. D., Captain, Medical Corps, U. S. Naval School of Aviation Medicine, Pensacola, Florida; and Paul D. White, M. D., Lecturer in Medicine, Harvard Medical School; with the assistance of Louise Wheeler, A. M., Executive Secretary, the Cardiac Laboratory, Massachusetts General Hospital; Conger Williams, M. D., Assistant in Medicine, Harvard Medical School Hospital. Second Edition. Pp. 458, with 323 illustrations. Cloth. Price $7.00. Philadelphia: W. B. Saunders Company, 1946.

While the general purpose and plan remains unchanged, several significant additions and changes have been made in the second edition of this well known work on electrocardiography. An excellent section on precardial leads has been added, together with their variations in health and disease. The electrocardiographic findings in several conditions are described which were not available for the original edition. The method of case presentation has been slightly altered, the interpretation of the electrocardiogram being given first. This is followed by the clinical findings and then a comment concerning the correlation of the two. The case histories are more complete, and four tables have been added which greatly enhance the value of the book. The arrangement and indexing of the material have also been greatly improved. The paper is, of course, inferior to the first edition, though the publishers are to be congratulated upon the relatively excellent quality of the work. The book is highly recommended to all who are interested in the clinical application of electrocardiography.

Principles of Dynamic Psychiatry. By Jules H. Masserman, M. D., Division of Psychiatry, University of Chicago. Pp. 322, with 4 plates. Cloth. Price, $4.00. Philadelphia: W. B. Saunders Company, 1946.

This little book provides an adequate introduction to the principles of modern dynamic psychiatry, outlines their application to the techniques of clinical diagnoses, and demonstrates the methods of therapy.

This book will have a wide circulation and will serve a most useful purpose in spreading among the young psychiatrists, psychologists, and psychiatric social workers the importance of an understanding of the principles of dynamic psychiatry.

Diseases of the Skin—For Practitioners and Students. By George Clinton Andrews, M. D., Associate Clinical Professor of Dermatology, Columbia University. Third edition. Pp. 937, with 971 illustrations. Cloth. Price, $10.00. Philadelphia: W. B. Saunders Company, 1946.

With the advent of the sulfa drugs, penicillin, streptomycin, contact therapy machines, etc., advances in dermatologic therapy have been made by leaps and bounds. Andrews has summarized all these advances and incorporated them in this new edition, the first in eight years. Every page has been rewritten The chapters on Roentgen-ray Therapy, Radium Therapy, and Roentgen-ray Physics are most helpful. The illustrations are on the crisp side—somewhat of a virtue. There is an excellent index. This is a book we recommend most heartily.

Pneumoperitoneum Treatment. By Andrew Ladislaus Banyai, M. D., Associate Clinical Professor of Medicine, Marquette University. Pp. 376, with 74 illustrations. Cloth. Price, $6.50. St. Louis: C. V. Mosby & Company, 1946.

Beginning with the treatment of tuberculous peritonitis fifty years ago, pneumoperitoneum had small recognition till the last 10 to 15 years, since which time it has been applied to the treatment of emphysema, bronchial asthma, and pulmonary abscess, hemorrhage and tuberculosis, postoperative adhesions, ulcerative colitis, intestinal hemorrhage, vomiting of pregnancy, etc., with some very encouraging results. Banyai's book covers these various fields of therapy completely, following several chapters on basic principles. No attempt is made to cover the diagnostic use of pneumoperitoneum. The illustrations are excellent, but for the sake of completeness should include the apparatus used and the actual techniques. These are well described in the text, but nothing talks better or clearer than a good picture. Concluding with an excellent bibliography, this well-documented monograph merits wide acceptance.